

What is claimed is:

1. A system for preventing lane deviation of a vehicle comprising:

5 a lane detecting device that detects a running lane of the vehicle;

a running condition detecting device that detects a running condition of the vehicle;

10 a deviation judging device that judges based on the detected running lane and the detected running condition of the vehicle whether the vehicle has a tendency to deviate from the running lane; and

15 a vehicle behavior control device that controls a behavior of the vehicle so as to generate a yaw moment in the direction to prevent the vehicle from deviating from the running lane in accordance with the detected running condition when the deviation judging device judges that the vehicle has a tendency to deviate from the running lane;

20 wherein the lane detecting device detects the running lane of the vehicle based on a variation in a running direction of the vehicle due to the yaw moment generated by the vehicle behavior control device.

2. A system according to claim 1, further comprising a steering condition parameter detecting device that detects a steering condition parameter, wherein the lane detecting device corrects the detected steering condition parameter by a steering condition parameter equivalent to the yaw moment generated by the vehicle behavior control device and detects the running lane based on the corrected steering condition parameter.

3. A system according to claim 1, further comprising a steering angle sensor for detecting a steering angle of a steering wheel, wherein the lane detecting device corrects the detected steering angle 5 by a steering angle equivalent to the yaw moment generated by the vehicle behavior control device and detects the running lane based on the corrected steering angle.

10 4. A system according to claim 1, wherein the vehicle behavior control device comprises a braking/driving force control amount calculating device that calculates a braking/driving force control amount of each wheel of the vehicle so as to generate 15 the yaw moment in the direction to prevent the vehicle from deviating from the running lane and a braking/driving force control device that controls a braking/driving force of each wheel of the vehicle in accordance with the calculated braking/driving force 20 control amount.

5. A system according to claim 1, wherein the deviation judging device judges that the vehicle has a tendency to deviate from the running lane when an 25 absolute value of an estimated lateral displacement in future is equal to or larger than a lateral displacement limit value.

30 6. A system according to claim 5, wherein the estimated lateral displacement in future is an estimated lateral displacement of the vehicle from a center of the running lane after a headway time.

7. A system according to claim 6, wherein the lateral displacement limit value is a value obtained by subtracting a half of a width of the vehicle from a half of a width of the running lane.

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8. A system for preventing lane deviation of a vehicle comprising:

    lane detecting means for detecting a running lane of the vehicle;

10     running condition detecting means for detecting a running condition of the vehicle;

    deviation judging means for judging based on the detected running lane and the detected running condition whether the vehicle has a tendency to 15 deviate from the running lane; and

    vehicle behavior control means for controlling a behavior of the vehicle in a way as to generate a yaw moment in the direction to prevent the vehicle from deviating from the running lane in accordance with the 20 detected running condition when the deviation judging means judges that the vehicle has a tendency to deviate from the running lane;

    wherein the lane detecting means detects the running lane based on a variation in a running 25 direction of the vehicle due to the yaw moment that is generated by the vehicle behavior control means.

9. A method for preventing lane deviation of a vehicle comprising:

30     detecting a running lane of the vehicle;

    detecting a running condition of the vehicle;

judging based on the detected running lane and the detected running condition whether the vehicle has a tendency to deviate from the running lane; and

5 controlling a behavior of the vehicle so as to generate a yaw moment in the direction to prevent the vehicle from deviating from the running lane in accordance with the detected running condition when the vehicle is judged to have a tendency to deviate from the running lane;

10 wherein the detecting of the running lane comprises detecting the running lane based on a variation in a running direction of the vehicle due to the yaw moment generated by the controlling of the behavior of the vehicle.

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10. A method according to claim 9, further comprising detecting a steering condition parameter, wherein the detecting of the running lane comprises correcting the detected steering condition parameter 20 by a steering condition parameter equivalent to the yaw moment generated by the controlling of the vehicle behavior and detecting the running lane based on the corrected steering condition parameter.

25 11. A method according to claim 9, further comprising detecting a steering angle of a steering wheel, wherein the detecting of the running lane comprises correcting the detected steering angle by a steering angle equivalent to the yaw moment generated 30 by the controlling of the vehicle behavior and detecting the running lane based on the corrected steering angle.

12. A method according to claim 9, wherein the controlling of the vehicle behavior comprises calculating a braking/driving force control amount of each wheel of the vehicle so as to generate a yaw 5 moment in the direction to prevent the vehicle from deviating from the running lane and controlling a braking/driving force of each wheel of the vehicle in accordance with the braking/driving force control amount.

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